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## NOTES AND NEWS.

It is hoped that readers of the **MONTHLY** will cooperate in contributing to the general interest of this department by sending items to the Editor-in-Chief.

Dr. TERESA COHEN, of The Johns Hopkins University, is an instructor of mathematics at Pennsylvania State College.

Dr. MARY G. HASEMAN is an instructor of mathematics at the University of Illinois.

Dr. W. L. CRUM, of Yale University, has been granted leave of absence for the second half of the current academic year to fill a temporary vacancy at Williams College, as assistant professor of mathematics, made by the absence of Professor J. G. HARDY who is on sabbatic leave in Europe.

Assistant Professor P. J. DANIELL, of the Rice Institute, has been promoted to be professor of applied mathematics. During the first semester of the current year he was studying in France.

At Kentucky Wesleyan College, on January 1, 1921, Professor C. S. VENABLE resigned as head of the department of mathematics, and was succeeded by Mr. J. P. BEAMAN, formerly of the Remy Electric Company, Anderson, Ind.

At Baylor University, Waco, Texas, P. C. PORTER, dean of the Baylor College for Women, Belton, Texas, has been appointed assistant professor of mathematics for the coming academic year.

Dr. HARLOW SHAPLEY, of the Mount Wilson Solar Observatory, Pasadena, Cal., an enthusiastic investigator in the structure of the sidereal universe, has been appointed observer of the Harvard College Observatory, and he entered upon his duties last March. "The position is a new one; it will give Mr. Shapley an opportunity to take an active part in the work of the Observatory in coöperation with the acting director, Professor S. I. BAILEY, and other members of the staff." (*Harvard Alumni Bulletin*, March 10, 1921.)

The following appointments and promotions were made in the autumn of 1920:

Mr. J. A. HERRINGTON, of the University of Wisconsin, was appointed associate professor of mathematics and engineering at Beloit College.

Mr. R. J. W. TEMPLIN was added, as instructor, to the department of mathematics at Lafayette College, Easton, Pa.

Mr. J. H. TAYLOR, assistant in mathematics at the University of Nebraska, was promoted to an instructorship.

Mr. F. J. ROGERS was appointed head of the department of mathematics at Shaw University, Raleigh, N. C.

Dr. E. D. GRANT, associate professor of mathematics at the Michigan College of Mines, was appointed head of the department of mathematics at Earlham College, Richmond, Ind.

At Carroll College, Waukesha, Wis., Dr. S. B. RAY resigned as head of the department of mathematics and Professor L. S. DANCEY was appointed as his successor.

At Clarkson College of Technology, Potsdam, N. Y., Professor H. M. ROYAL, who was for nine years head of the department of mathematics, resigned, and Mr. T. L. HAMLIN, instructor of mathematics at Union College, Schenectady, N. Y., was appointed as his successor. Mr. L. W. COMSTOCK, Mr. L. A. DE RONDE, Mr. C. V. TERWILLIGER, and Mr. W. L. WARNER, were appointed instructors of mathematics at Union College.

Mr. L. C. BAGLEY, of Washburn College, Topeka, Kan., was appointed professor of mathematics at Ottawa University, Ottawa, Kan., in place of Miss GRACE E. JEFFERSON who was appointed instructor of mathematics at Denison University, Granville, Ohio.

Mr. G. F. ROUSE was appointed instructor of mathematics at Cornell College, Mt. Vernon, Iowa.

At Illinois College, Jacksonville, Ill., Mr. G. H. SCOTT, professor of mathematics and physics, was appointed dean of the college, and Miss LOIS DANIELS, instructor in mathematics and physics.

At the College of Wooster, Wooster, Ohio, Instructor C. O. WILLIAMSON was promoted to be an assistant professor of applied mathematics.

At Alfred College, Alfred, N. Y., A. B. KENYON, professor of mathematics for forty-seven years, retired as dean of the college, and Mr. W. A. TITSWORTH has been transferred from the physics department to become head of the department of mathematics.

At Grove City College, Pa., J. H. BILES resigned as assistant professor of mathematics and physics, to become head of the department of mathematics at Centre College, Danville, Ky. He was succeeded by Mr. G. A. BECKER, formerly with the University of New York City.

At West Virginia Wesleyan College, Professor C. E. WHITE resigned to accept a position at Muskingum College, New Concord, Ohio, and he was succeeded by Instructor THURMAN ANDREW.

At the University of Alabama, Mr. F. A. LEWIS, formerly of the Texas Agricultural and Mechanical College, and Dr. E. KUSCHKE, formerly of the University of California, were appointed assistant professors of mathematics.

At Wesleyan University, Professor FREDERICK SLOCUM, of Brown University, returned as professor of astronomy and director of the Van Vleck Observatory; Mr. C. L. STEARNS, instructor of astronomy and mathematics (1919, 86), was appointed to a position in the Yale Observatory.

At Randolph-Macon College, Ashland, Va., Mr. B. F. WALTON was appointed instructor of mathematics.

At The Citadel, the military college of South Carolina, Major R. G. THOMAS, professor of mathematics and engineering for thirty-one years, was made professor emeritus. He was succeeded by Colonel O. J. BOND in the department of mathematics, which is now separate from the department of civil engineering.

At Albion College, Mich., Instructor A. I. BLESS resigned to become instructor of mathematics at the University of Maine, and Professor A. A. McSWEENEY, of Grand Island College, Neb., was appointed assistant professor in applied mathematics and astronomy.

At Rockford College, Ill., Miss JESSIE M. JACOBS (see 1920, 337) resigned as associate professor of mathematics and physics, and was succeeded by Instructor STELLA M. ALLEN, of Columbia University.

At Southern College, Clearwater, Fla., W. W. WEBER, professor of mathematics, was appointed dean of the College.

At Goucher College, Baltimore, Md., Associate Professor FLORENCE P. LEWIS was promoted to be professor of mathematics.

At Colgate University, Hamilton, N. Y., Mr. TORVALD FREDERIKSEN was appointed instructor. Assistant Professor E. P. SISSON was granted leave of absence for the year 1920-21.

At Fairmont College, Wichita, Kan., Mr. H. G. TITT, formerly of Yankton College, S. D., was appointed professor of mathematics and dean of the College of Liberal Arts to succeed Professor A. J. HOARE.

At the State College of Washington, Assistant Professor F. N. BRYANT resigned to accept a position in the department of mathematics at Syracuse University; Miss GLADYS H. FREEMAN, of the University of Chicago, and Mr. H. H. IRWIN were appointed instructors of mathematics.

At the College of William and Mary, Williamsburg, Va., Mr. J. S. COUNSELMAN was appointed professor of mathematics and Mr. J. C. LYONS, assistant professor.

At Shorter College, Rome, Ga., Miss JENNIE D. EHLERS, of Columbia University, was appointed instructor of mathematics. Miss RUBY U. HIGHTOWER has been in charge of the department for some time.

At Ripon College, Wis., Mr. WILLIAM BOLLENBECK was appointed instructor of mathematics.

At Villanova College, Pa., Reverend J. S. O'LEARY was appointed professor of mathematics, succeeding Reverend F. A. DRISCOLL, now president of the College. The following have been added to the mathematical staff: Reverend WILLIAM DONOVAN, Mr. E. T. DICKENSON, and Mr. J. A. CRAWFORD.

At Washington and Lee University, Lexington, Va., Mr. EARLE K. PAXTON was appointed assistant professor of mathematics.

Dr. A. H. NORTON, formerly vice-president and head of the department of mathematics in Elmira College, was appointed president and head of the department of mathematics in Keuka College for Women, Keuka Park, N. Y.

At the University of Tennessee, Professor J. B. HAMILTON was made head of the department of mathematics.

At the University of Vermont, Mr. H. G. MILLINGTON and Mr. F. W. HOUSEHOLDER were appointed instructors of mathematics.

At Meredith College, Professor E. F. CANADAY, of the University of South Dakota, was appointed professor of mathematics, succeeding Dr. IDA BARNEY (see 1920, 336).

At Randolph-Macon Woman's College, Lynchburg, Va., Dean N. A. PATILLO, head of the department of mathematics, was granted sabbatic leave to study in Paris. Adjunct Professor GILLIE A. LAREW has been acting head of the department. Miss VIRGINIA WATTS, of the University of Chicago, was appointed instructor of mathematics.

At Central Wesleyan College, Warrenton, Mo., Professor J. H. FRICK, head of the department of mathematics for fifty years, retired. He was succeeded by Mr. H. V. KNORR.

At Carleton College, Northfield, Minn., Dr. V. H. WELLS, formerly statistician in the Treasury Department, was appointed assistant professor of mathematics.

At the University of Florida, Mr. P. A. LUCAS was appointed acting assistant professor of mathematics and physics to succeed Mr. WARREN HIGGINS who resigned to become head of the department of mathematics in the Southern Presbyterian College, Clarksville, Tenn.

At Tufts College, Mass., Assistant Professor HARRIS RICE resigned to accept a similar position at Worcester Polytechnic Institute, Mass.; Mr. B. A. HAZELTINE and Miss EDITH L. BUSH were appointed instructors of mathematics.

At the University of Oklahoma, Assistant Professor H. C. GOSSARD resigned to take up work in the Y. M. C. A. and Instructor BETTIE STEPHENS resigned to become a missionary teacher in China. Dr. J. O. HASSLER, of Crane Junior College, Chicago, was appointed associate professor of mathematics and Mr. H. G. LIEBER, Miss ELLA MANSFIELD and Miss DORA MCFARLAND were appointed instructors. Assistant Professor E. D. MEACHAM has been on leave of absence since January, 1921, studying at the University of Chicago; this leave of absence will continue to the end of the next academic year.

JULIUS SCHMITTLE HOFFMAN, instructor of mathematics at Tufts College from September, 1919, died June 29, 1920. Born in New Orleans, La., October 23, 1896, he received the degree Bachelor of Arts from Tulane University, La., in 1917, and the degree Master of Arts from Harvard University in 1918.

MARY WATSON WHITNEY, professor emeritus of astronomy, and from 1889 to 1910 director of the Observatory, of Vassar College, died January 20, 1921. She was born at Waltham, Mass., September 11, 1847. Graduating from Vassar College she studied for a time also at the University of Zürich. In 1881 she became an assistant to Professor Maria Mitchell of Vassar.

WILLIAM THOMPSON SEDGWICK, professor of biology and public health at the Massachusetts Institute of Technology since 1883, died January 25, 1921. He was born at Hartford, Conn., December 29, 1855. In 1917 he collaborated with Professor H. W. TYLER in publishing *A Short History of Science* (New York, Macmillan), which was an "outgrowth of a lecture course given by the authors for several years to undergraduate classes of the Massachusetts Institute of Technology."

SHERBURNE WESLEY BURNHAM, professor of practical astronomy, and astronomer in the Yerkes Observatory, University of Chicago, from 1893 until his re-

tirement in 1914, died March 11, 1921. He was born in Thetford, Vermont, December 12, 1838. He served in several observatories for nearly twenty years before his appointment as astronomer at the Lick Observatory in 1888. From there he went to the Yerkes Observatory. He discovered 1274 new double stars and most of his publications have been in this connection. The 1100-page *General Catalogue of Double Stars within 121° of the North Pole* was published by the Carnegie Institution of Washington in 1906. The same institution published, in 1913, his volume on *Measures of Proper Motion Stars*. His double star observations at the Lick Observatory fill volume 2, 1894, of *Publications of the Lick Observatory of the University of California* and similar observations made at the Dearborn Observatory 1877–1878 occupy nearly 170 pages of volume 44, 1879, of *Memoirs of the Royal Astronomical Society*. More than a score of his minor publications are listed in *Publications of the Members of the University of Chicago 1902–1916*, Chicago, 1917.

ROBERT BELLAMY CLIFTON, professor of experimental philosophy in the University of Oxford 1865–1915, died February 21, 1921 (cf. this MONTHLY 1920, 274). He was born March 13, 1836, became sixth wrangler in the Cambridge tripos of 1859, and second Smith's prizeman, the senior wrangler and first Smith's prizeman being Canon Wilson (cf. 1920, 130). His mathematical publications were few and slight. Three may be found in *Quarterly Journal of Mathematics*, 1860; *Transactions of the Cambridge Philosophical Society*, 1866; *Proceedings of the Royal Society of London*, 1877.

MARIE GEORGES HUMBERT, professor at the Ecole Polytechnique and the Collège de France, died January 22, 1921. He was born in Paris, January 7, 1859. Entering the Ecole Normale Supérieure in 1878 he became an agrégé ès sciences mathématiques in 1881 and received the state doctorate from the University of Paris in 1885, his thesis being entitled: *Sur les courbes du genre un*. He succeeded Hermite as a member of the Institute of France in 1901. A survey of his scientific work up to that time was published in pamphlet form. He is probably best known to Americans by his two volume *Cour d'analyse professé à l'Ecole Polytechnique*, 1903–1904, where geometric applications are especially emphasized. This work was a development of lithographed sections appearing 1895–1902. His memoirs in *American Journal of Mathematics*, 1888 and 1894, will be recalled. Other biographical details and a portrait may be found in *Acta Mathematica 1882–1912. Table Générale des tomes 1–35*, Upsala, 1913. "Humbert may be compared with Clebsch, because, although he may not have invented a new mathematical engine, he showed unexpected uses of those already provided. In his hands Abel's theorem and Poincaré's researches on Fuchsian functions became magic keys to unlock the treasures of geometry, and give us concrete and elegant images of analytical ideas." ("M." in *Nature*, March 17, 1921).

ACHILLE MARIE GASTON FLOQUET, at different times professor of mathematics, of analysis, and of astronomy, at the University of Nancy since 1880, died October 7, 1920. He was born December 15, 1847. Student at the Ecole

Normale Supérieure 1867–73, agrégé ès sciences mathématiques 1875, and teacher in lycées 1873–78, he was appointed maître de conférence at the University of Nancy in 1878. He received the state doctorate from the University of Paris in 1879, and his elaborate dissertation on the theory of linear differential equations was published in *Annales de l'Ecole Normale Supérieure*, vol. 8, supplement. He developed this subject afterwards in this same periodical, in *Bulletin de la Société des Sciences de Nancy*, and in *Comptes Rendus . . . de l'Académie des Sciences*. It will be recalled that he was the French editor of “Propriétés générales des systèmes d'équations aux dérivées partielles. Equations linéaires du premier ordre” (the original German article being by E. von Weber) in *Encyclopédie des Sciences Mathématiques*, tome 2, vol. 4, fasc. 1, 1913. Thirty-five of his mathematical and astronomical papers, and pamphlets, are listed in *Catalogue générale des livres (imprimés) de la Bibliothèque Nationale*, Paris, vol. 52, 1913. We have already recorded (1919, 419) Professor Floquet's retirement from the University of Nancy, as honorary professor. He was also honorary dean of the faculty of sciences.

Professor E. W. BROWN of Yale University was, on January 31, 1921, unanimously elected a corresponding member of the section in astronomy of the Academy of Sciences of the Institute of France (see 1920, 384). He succeeded the late Professor E. C. Pickering, of Harvard University (1919, 134).

For the summer meeting of the Mathematical Association of America the president has appointed the following committees: Program Committee—Professor W. R. LONGLEY (chairman), Professor C. A. FISCHER, Professor E. V. HUNTINGTON, and Professor SARAH E. SMITH; Committee on Arrangements—Professor CLARA E. SMITH (chairman), Professor W. D. CAIRNS, Professor LENNIE P. COPELAND, Professor OLIVE C. HAZLETT, Professor E. J. MILES and Professor H. B. PHILLIPS.

On the occasion of the mathematical congress at Strasbourg last September, the four mathematicians who gave “general lectures” at the congress (1920, 439) were elected honorary members of the Society of Sciences, Agriculture, and Arts of the Lower Rhine. It will be recalled that Professor L. E. DICKSON, of the University of Chicago, was one of these lecturers.

Professor H. S. WHITE's three year period as a representative of the American Mathematical Society in the Division of Physical Sciences of the National Research Council expires July 1, and Professor E. B. VANVLECK has been appointed as his successor. The other representatives of the Society are Professors L. E. DICKSON and OSWALD VEULEN. Professor G. D. BIRKHOFF is a “member at large” of the Division, and Professor E. R. HEDRICK is the representative of the Mathematical Association of America.

As a result of the conference to which we have already made reference (1921, 151) there was organized a committee of the National Research Council on the Mathematical Analysis of Statistics. The members of the committee are

Professors J. W. GLOVER, of the University of Michigan, E. V. HUNTINGTON, of Harvard University, T. L. KELLEY, of Leland Stanford University, RAYMOND PEARL, of The Johns Hopkins University, W. M. PERSONS, of Harvard University, and H. L. RIETZ (chairman), of the University of Iowa.

According to the new constitution of the American Association for the Advancement of Science, four instead of five members in addition to the chairman and secretary constitute a sectional committee "which shall in all ways promote the object of the Association within its own field." In Section A this committee is as follows: Professor OSWALD VEBLEN, chairman and a vice-president of the Association, who will preside at Toronto in 1921 and deliver his retiring address in 1922; Professor W. H. ROEVER, secretary until the meeting of 1924-25; Professor DUNHAM JACKSON (January, 1920-December, 1924); Professor A. D. PITCHER (January, 1920-December, 1923); Professor G. A. BLISS (January, 1920-December, 1921); and Professor J. M. PAGE (January, 1920-December, 1921). See also 1921, 151.

At the Mathematics Section of the New York State Teachers Association which met in Rochester, November 23, 1920, the following papers were read by members of the Association: "Recent tendencies in secondary mathematics" by Mr. FLETCHER DURRELL; "Junior high school mathematics" by Professor J. W. YOUNG; "Motivation of first lessons in junior high school geometry" (illustrated by lantern slides) by Mr. WILLIAM BETZ.

At the annual meeting of the mathematics section of the Washington State Educational Association held at Yakima, October 28, 1920, Professor W. C. EELLS, of Whitman College, spoke on the work of the National Committee on Mathematical Requirements.

At the meeting of the mathematics section of the Nebraska State Teachers Association on November 5, 1920, Professor A. L. CANDY, of the University of Nebraska, delivered an illustrated address on mathematics in European countries, and Professor J. W. YOUNG, of Dartmouth College, discussed the work of the National Committee on Mathematical Requirements. Professor W. C. BRENKE, of the University of Nebraska, was appointed chairman of a committee to distribute throughout Nebraska the reports of the National Committee.

The annual meeting of the mathematics section of the Missouri Society of Science and Mathematics Teachers was held at Kansas City, on November 11, 1920. Mr. ALFRED DAVIS, of the Soldan High School, St. Louis, was elected president, and Miss EULA A. WEEKS, of the Cleveland High School, St. Louis, secretary, for the current year. Professor U. G. MITCHELL, of Kansas University, addressed the meeting on "The unification of elementary mathematics"; and Mr. A. C. ANDREWS, of the Manual Training High School, Kansas City, and Mr. DAVIS spoke regarding the work of the National Committee on Mathematical Requirements and of the National Council of Teachers of Mathematics.

At the mid-winter meeting of the Association of Teachers of Mathematics in New England, in Worcester Academy, Worcester, March 5, 1921, the following

papers were read by members of the Mathematical Association of America: "The teaching of mathematics; its need and place in the curriculum" by Professor F. B. WILLIAMS; "Mathematical principles of educational statistics" by Professor R. W. BURGESS.

At the first meeting of the Connecticut Valley section of the Association of Teachers of Mathematics in New England, in Hartford, November 6, 1920, the following papers were read by members of the Mathematical Association of America: "Preliminary report of the National Committee on College Entrance Requirements" by W. F. DOWNEY; "The mathematics of the freshman year at Yale" by W. R. LONGLEY. The officers for 1921 of the Association of Teachers of Mathematics in New England include the following: President, W. F. DOWNEY, English High School, Boston; vice-president, C. H. CURRIER, Brown University; member of the council, GERTRUDE E. PRESTON, Dana Hall, Wellesley College.

At the fifteenth regular western meeting of the American Mathematical Society, held in Chicago, December 29-30, 1920, the following papers were presented: "Elementary geometry in  $n$  dimensions" by R. P. BAKER; "Invariant points under transformations in function space" by G. D. BIRKHOFF and O. D. KELLOGG; "On the complete characterization of the set of points of approximate continuity" by HENRY BLUMBERG; "On the history of symbols for  $n$ -factorial" by FLORIAN CAJORI; "Note on the permutability of functions which have the same Schmidt fundamental functions," "Note on convergence in the mean," and "On kernels which have no Fredholm fundamental functions" by E. W. CHITTENDEN; "Applications of algebraic and hypercomplex numbers to the complete solution in integers of quadratic diophantine equations in several variables," "Arithmetic of quaternions," "Determination of all general homogeneous polynomials expressible as determinants with linear elements," and "Homogeneous polynomials with a multiplication theorem" by L. E. DICKSON; "An adaptation of Bing's paradox, involving an arbitrary *a priori* probability" by E. L. DODD; "Boundary value problems with regular singular points (second paper)" by H. J. ETTLINGER; "Fundamental points of potential theory" by G. C. EVANS; "Comparison of different line-geometric representations for functions of a complex variable" by GLADYS E. C. GIBBENS; "Functionals of summable functions" by W. L. HART; "Note on an ambiguous case of approximation," "Note on the convergence of weighted trigonometric series," "On the method of least  $m$ th powers for a set of simultaneous equations," and "On the trigonometric representation of an ill-defined function" by DUNHAM JACKSON; A convergence theorem of Osgood's, with an application" by O. D. KELLOGG; "On polynomials and their residue systems (second paper)" by A. J. KEMPNER; "The integrals  $\int_0^x e^{x^2/2} dx$ ,  $\int_0^x \sin \frac{x^2}{2} dx$ ,  $\int_0^x \cos \frac{x^2}{2} dx$  and associated divergent series" by W. D. MACMILLAN; "On amicable numbers and their generalizations" by T. E. MASON; "I-conjugate operators of an abelian group" by G. A. MILLER; "A closed connected set of points which contains no simple continuous arc," and "Conditions under which one of two given closed linear point sets may be

thrown into the other one by a continuous transformation of a plane into itself" by R. L. MOORE; "Determination of the spherical transformation in Grassmann's extensive algebra," and "On the relation of iterative compositional equations to Lie's theory of transformation groups" by A. R. SCHWEITZER; "Expansion of the double-frequency function into a series of Hermite's polynomials" by E. R. SMITH; "Construction of doubly periodic functions with singular points in the period parallelogram" by W. P. WEBBER; "Isothermally conjugate nets," and "Transformation of conjugate nets into conjugate nets" by E. J. WILCZYNSKI.

At the United States Naval Academy there are in the department of mathematics, besides two officers in the navy, 3 professors, 7 associate professors, 7 assistant professors, and 21 instructors. Assistant Professor ARTHUR KIERNAN was promoted to an associate professorship last November.

At the University of Washington, the College of Business Administration has made a course in the elements of statistical methods, offered by the department of mathematics, a requirement for all students in the College. This means that twelve sections of the work will have to be offered during the coming year. The required work in mathematics in the College of Business Administration lasts for three quarters, five hours each; two quarters for the theory of investments and one quarter for the course in statistical methods.

Additional announcements (cf. 1921, 194) of courses in mathematics at Summer Sessions in 1921, are as follows:

*The University of Chicago*, First Term, June 20–July 27; Second Term, July 28–September 2, 1921. By Professor E. H. MOORE: Hermitian matrices of positive type, 4 hours, and Determinants, 4 hours, first term only. By Professor H. E. SLAUGHT: Definite integrals, 4 hours, and Differential calculus, 5 hours. By Professor L. E. DICKSON: Seminar on algebra and theory of numbers, 2 hours, and Solid analytic geometry, 4 hours. By Professor E. J. WILCZYNSKI: Projective differential geometry, 4 hours, and College algebra, 5 hours. By Professor A. C. LUNN: Applications of vector analysis to electromagnetism, 4 hours, and Units and dimensions, 4 hours. By Professor J. W. A. YOUNG: Selected topics of mathematics, 4 hours, and Integral calculus, 5 hours. By Professor S. LEFSCHETZ: Selected chapters of algebraic geometry, 4 hours, and Plane analytic geometry, 5 hours. By Professor Henry BLUMBERG: Functions of a real variable, 4 hours, and Plane trigonometry, 5 hours.

*Cornell University*, July 5–August 12. By Professor V. SNYDER: Projective geometry, 5 hours. By Professor W. A. HURWITZ: Advanced analysis, 5 hours. In addition to these courses, provision for thesis work is offered as follows: By Professor SNYDER, in algebraic geometry; by Professor F. R. SHARPE, in Fourier series and the potential theory; by Professors W. B. CARVER and F. W. OWENS, in projective geometry; by Professor C. F. CRAIG, in functions of a complex variable.

*University of Illinois*, June 20–August 13. In addition to the usual courses in College algebra, Plane trigonometry, Analytic geometry, Differential calculus, and Integral calculus the following advanced courses are offered for graduate and advanced undergraduate students: By Professor A. B. COBLE: Differential geometry, and Projective geometry. By Professor A. J. KEMPNER: Theory of equations and determinants, and Advanced calculus. By Professor G. E. WAHLIN: Introduction to group theory and the Galois theory of equations. Each course meets five hours per week.

*University of Iowa*, First Term, June 13–July 23. By Professor J. F. REILLY: Teachers' course, and Solid geometry. By Dr. W. H. WILSON: Trigonometry, Calculus, and Theory of equations. By Dr. ROSCOE WOODS: College algebra, Analytic geometry, and Advanced calculus. By Mr. R. E. GLEASON: Solid geometry, and Whittaker and Watson's *Modern Analysis*. Second Term, July 25–August 26. By Professor R. P. BAKER: Analytic geometry, Projective geometry, and Reading course. By Professor CHITTENDEN: Calculus, and Reading course. By Mr. GLEASON: College algebra, and Reading course. The courses are five hours per week in class through the sessions. When transformed into hours of the ordinary academic year the credit for each course taken during the first session is two semester hours and for the second session five-sixths of this amount.

*University of Michigan*. July 1–August 26. By Professor W. W. BEMAN: Differential equations, and Teachers course in algebra and geometry. By Professor J. W. GLOVER: Finite differences, and Theory of probability. By Professor W. B. FORD: Advanced calculus, and Higher algebra. By Professor P. FIELD: Advanced mechanics. By Professor T. R. RUNNING: Empirical formulas. By Professor L. C. KARPINSKI: History of mathematics. By Professor J. W. BRADSHAW: Calculus, and Advanced analytic geometry. By Professor H. C. CARVER: Introduction to the mathematical theory of interest, and Actuarial exercises and problems. Each course meets four hours per week, credit two hours.

*University of Oklahoma*, June 8–August 2. By Professor S. W. REAVE: Analytic geometry, 5 hours, and Bôcher's *Higher Algebra*, 3 hours. By Professor J. O. HASSLER: Trigonometry, 3 hours, Differential equations, 3 hours, and Teaching of secondary mathematics, 2 hours. By Professor N. ALTSHILLE COURT: College algebra, 3 hours, Differential calculus, 3 hours, and Integral calculus, 3 hours.

*University of Pennsylvania*, July 5–August 13. By Mr. J. M. THOMAS: Solid geometry, and College algebra. By Professor G. H. HALLETT: Plane trigonometry, Integral calculus, and Theory of groups of a finite order. By Professor H. H. MITCHELL: Intermediate algebra, Differential calculus, and Analytic geometry. By Professor F. W. BEAL: Analytic geometry, Advanced plane and spherical trigonometry, and Differential geometry. These courses will be accepted as two thirds of regular semester courses.